

We Claim:

1. A process for imparting colour to a mineral, said process comprising coating said mineral substrate with one or more colour inducing/enhancing materials and subjecting said coated mineral substrate to heat treatment at a temperature in the range of about 900°C up to about 1250°C for a time in the range of about 30 minutes to about 10 hours in an appropriate ambience to obtain a coloured substrate.
2. A process as claimed in claim 1 wherein the substrate comprises a gemstone.
3. A process as claimed in claim 2 wherein the said gemstone is selected from topaz and sapphire.
4. A process as claimed in claim 1 wherein the substrate is cleaned before coating.
5. A process as claimed in claim 1 wherein the colour inducing/enhancing material is coated onto the substrate in the form of a thick or thin film depending on the intensity of the colour required for the final product.
6. A process as claimed in claim 1 wherein two or more colour inducing/enhancing materials are coated on to the substrate at different portions thereof in order to obtain bicoloured or multicoloured substrates.
7. A process as claimed in claim 6 wherein the said two or more colour inducing/enhancing substrates are of varying thickness depending on the intensity of colour induction/enhancement desired in the substrate.
8. A process as claimed in claim 1 wherein the colour inducing/enhancing material is incorporated into the crystal lattice of the substrate.
9. A process as claimed in claim 1 wherein the colour inducing/enhancing material is chemically bonded onto the surface of the substrate.
10. A process as claimed in claim 1 wherein the colour inducing/enhancing material is selected from the group consisting of metal, a metal oxide, a metallic compound and an alloy.
11. A process as claimed in claim 10 wherein the metal or metal oxide is a transition metal or a transition metal oxide respectively.
12. A process as claimed in claim 10 wherein the metal is selected from the group consisting of cobalt, cobalt containing material, iron, iron containing material, chromium, chromium containing material and any mixture thereof.
13. A process as claimed in claim 10 wherein the metal oxide is selected from cobalt oxide and iron oxide.

14. A process as claimed in claim 12 wherein said cobalt containing material is selected from the group consisting of cobalt-chromium and cobalt oxide-chromium oxide.
15. A process as claimed in claim 12 wherein said iron containing material is selected from the group consisting of iron-nickel-chromium and iron oxide-nickel oxide-chromium oxide.
16. A process as claimed in claim 5 wherein the colour inducing/enhancing material film is selected from chromium or chromium oxide.
17. A process as claimed in claim 1 wherein the colour inducing/enhancing is coated onto the substrate in the form of multiple films of different metals or alloys.
18. A process as claimed in claim 17 wherein first metal film coated on the substrate is cobalt and the second film is of chromium.
19. A process as claimed in claim 17 wherein first metal film coated on the substrate is iron and the second film is of chromium-nickel.
20. A process as claimed in claim 18 wherein the substrate comprises topaz and the coated substrate is heated at a temperature range between 1000 to 1100°C in air or an inert or reducing gas for a time in the range of 30 minutes to 5 hours to induce London, Baby, Swiss and Sky blue colours.
21. A process as claimed in claim 1 wherein the substrate comprises topaz, said substrate being coated with a film of a cobalt or a cobalt containing material and being heated at a temperature in the range of 1000°C to 1100°C in the presence of air or a reducing or an inert gas for a time in the range of 30 minutes to 5 hours to induce light blue to dark blue colour.
22. A process as claimed in claim 1 wherein the substrate comprises topaz said substrate being coated with a film of a cobalt or a cobalt containing material and being heated at a temperature in the range of 900°C to 1000°C in air or an oxidising gas for a time in the range of 30 minutes to 3 hours to obtain light green to dark green colour.
23. A process as claimed in claim 1 wherein the substrate comprises topaz said substrate being coated with a film of a cobalt or a cobalt containing material and being heated at a temperature in the range of 950°C to 1050°C in air for such time to induce green-blue or blue – green colour in the substrate.
24. A process as claimed in claim 1 wherein said substrate comprises topaz and a film of iron containing material is coated thereon and heat treatment is carried out in air or

- oxidising gas at a temperature in the range of 700 to 900°C for 30 min. to 3 hours to obtain colours from yellow to orange and reddish-orange.
25. A process as claimed in claim 1 wherein said substrate comprises topaz and a film of iron material, followed by chromium and nickel is coated thereon and heat treatment is carried out in air or oxidising gas at a temperature in the range of 700 to 900°C for 30 min. to 3 hours to obtain colours from imperial to reddish imperial.
26. A process as claimed in claim 1 wherein said substrate comprises topaz and is heated at a temperature in the range of 700°C to 1050°C in air or an oxidising gas for a time in the range of 30 minutes to 5 hours to induce green colour.
27. A process as claimed in claim 6 wherein said substrate is topaz, and is coated with films of different colour inducing/enhancing materials and heated at a temperature in the range of 700°C to 1050°C in air or an oxidising gas for a time in the range of 30 minutes to 5 hours to obtain bi-coloured or multicoloured substrates.
28. A process as claimed in claim 1 wherein the substrate comprises sapphire and the colour obtained ranges from dark blue to light blue, or dark green to light green or a mixture thereof depending on the time and temperature cycle employed for the treatment.
29. A process as claimed in claim 5 wherein the colour inducing/enhancing film is coated onto the mineral substrate by physical vapour deposition and/or chemical vapour deposition.
30. A process as claimed in claim 1 wherein said substrate is cleaned to remove dust, grease or any other foreign contaminant adhering to the stone surface.
31. A colour induced/enhanced mineral substrate prepared by the process of claims 1 to 30 wherein said substrate comprises a gemstone selected from topaz and sapphire.
32. A colour induced/enhanced substrate as claimed in claim 31 wherein the colour imparting/enhancing material is incorporated into the outer surface and/or chemically bonded to the surface atoms thereof.
33. A colour induced/enhanced substrate as claimed in claim 32 wherein the colour inducing/enhancing material is selected from the group consisting of cobalt, cobalt containing material, chromium, chromium containing material, iron and iron containing material, and any mixture thereof.
34. A colour induced substrate as claimed in claim 33 wherein said induced colour is selected from the group consisting of blue, green, blue-green, green-blue, Swiss blue,

London blue, sky blue, Baby blue, yellow, orange, reddish orange, imperial and reddish imperial.

35. A colour induced substrate as claimed in claim 34 wherein the colour inducing/enhancing material is incorporated into the substrate surface and/or chemically bonded onto the substrate surface.
36. A colour induced/enhanced substrate as claimed in claim 34 wherein the colour inducing/enhancing material is incorporated into the substrate surface and/or chemically bonded onto the substrate surface said colour inducing/enhancing material being selected from the group consisting of cobalt, cobalt containing material, chromium, chromium containing material, iron and iron containing material and wherein said gemstone is selected from topaz and sapphire.
37. A colour induced/enhanced substrate as claimed in claim 37, wherein said induced colour is blue, green, blue-green, green-blue or Swiss blue for cobalt and cobalt containing film materials, yellow or reddish-yellow for iron and iron containing materials, green for chromium and chromium containing materials, pink to reddish pink for copper and copper containing materials.
38. A colour induced substrate wherein said substrate is topaz, and said induced colour is blue.
39. A colour induced/enhanced substrate wherein the substrate comprises topaz and the colour induced thereon is selected from London, Baby, Swiss and Sky blue colours.
40. A colour induced/enhanced substrate wherein the substrate comprises topaz and the colour induced thereon is selected from light blue to dark blue colour.
41. A colour induced/enhanced substrate wherein the substrate comprises topaz and the colour induced thereon is selected from light green to dark green colour.
42. A colour induced/enhanced substrate wherein the substrate comprises topaz and the colour induced thereon is selected from green-blue or blue – green colour in the substrate.
43. A colour induced/enhanced substrate wherein the substrate comprises topaz and the colour induced thereon is selected from yellow to orange and reddish-orange.
44. A colour induced/enhanced substrate wherein the substrate comprises topaz and the colour induced thereon is selected from imperial to reddish imperial.
45. A colour induced/enhanced substrate wherein the substrate comprises topaz and the colour induced thereon is selected from green colour.

46. A colour induced/enhanced substrate wherein the substrate comprises sapphire and the colour obtained ranges from dark blue to light blue, or dark green to light green or a mixture thereof depending on the time and temperature cycle employed for the treatment.